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Epoch.	Observer.	θ_o	θ_c	$\theta_o-\theta_c$	ρ_o	ρ_c	$\rho_o-\rho_c$
		°	°	°	″	″	″
1885·301	Hall	33·87	33·09	+0·78	7·93	8·01	−0·08
1886·047	Young	29·74	30·26	−0·52	7·59	7·57	+0·02
1886·14	Wash. Obs.	30·57	29·90	+0·67	7·21	7·51	−0·30
1886·144	Hough	28·67	29·88	−1·21	7·21	7·51	−0·30
1886·22	Wash. Obs.	28·66	29·53	−0·87	7·39	7·46	−0·07
1887·14	Young	25·36	25·32	+0·04	7·08	6·84	+0·24
1887·195	Hough	23·66	25·04	−1·38	6·78	6·80	−0·02
1887·238	Hall	24·14	24·82	−0·68	6·508	6·77	−0·262
1888·97	Burnham	13·85	13·96	−0·11	5·27	5·52	−0·25

I have computed the following short ephemeris:—

Epoch.	Position-angle.	Distance.
	°	″
1890·2	2·61	4·62
1891·2	349·68	3·95
1892·2	332·27	3·45
1893·2	310·88	3·23
1894·2	288·95	3·36
1895·2	270·37	3·78
1896·2	255·95	4·24

On the close Conjunction of Mars and Saturn near Regulus on September 19, 1889. By A. Marth.

The conjunction of *Mars* and *Saturn* predicted in the Almanacs for September 19, 20^h G.M.T., deserves special attention. The tabular places of the two planets give the nearest geocentric approach of their centres 54″·8 at 20^h 7^m Greenwich mean time, so that the conjunction will be a closer one than that of June 30, 1879, when the shortest distance between the nearest limbs was 74″, according to the Melbourne observations, *Monthly Notices*, vol. xl. p. 30. The next close conjunction preceding that of 1879 took place on April 18, 1817, but was not observable at any then existing observatory, and of any previous close conjunction there is at least no record.

The differences of right ascension and declination between *Titan* and *Iapetus* and the centre of *Saturn* will be

		Titan.		*Iapetus.*	
		α_6-A.	δ_6-D.	α_8-A.	δ_8-D.
	h	s	″	s	″
Sept. 19	16 Gr.	−7·81	−34·6	+11·54	−11·7
	20 „	7·25	35·0	11·12	11·5
20	0 „	−6·66	−35·2	+10·70	−11·3

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Hence the geocentric differences between *Mars* and *Iapetus* will be

			♂ − α_8	♂ − δ_8
	h	m	s	″
Sept. 19	22	0 Gr.	−0·30	+12·9
		10	+0·54	+ 8·5
	22	20	+1·38	+ 4·1

If these tabular values are not too much in error, observers in America may get the rare chance of observing, if not an actual occultation of *Iapetus* by *Mars*, at least a very close conjunction of the two bodies, which, even as a mere *curiosum*, will be worth attending to.

What renders this year's conjunction between *Mars* and *Saturn* specially remarkable and interesting, is the circumstance that it takes place not far from *Regulus*, the geocentric distance of *Mars* from the star being

	h		′	″		°
Sept. 19	18 Gr.	Distance	47	57·3	Posit.-angle	5·74
	20 „		47	17·0		9·43
	22 „		46	48·8		13·24

and it has seemed to me worth while to examine when such a phenomenon has occurred before. On the occasion of an oral communication made at the June meeting of the Royal Astronomical Society in 1877, I showed some diagrams referring to triple conjunctions between *Mars* and *Saturn*, some of which were reproduced in the report published in the *Astronomical Register*, vol. xv. p. 156 ff. One of these diagrams exhibited the path of *Mars* relative to *Saturn* from November 1742 to June 1743, the third conjunction occurring on May 17, when *Mars* passed *Saturn* at a distance of 10′ to the south. On June 1 this conjunction was followed by a close conjunction between *Mars* and *Jupiter* at a distance of only 72″. Referring to Cassini's paper in the *Paris Memoirs* of 1743, p. 318 ff., and to the graphical representation there given, it will be found that *Regulus* formed with the planets a most interesting constellation, the star being at the time of the conjunction of May 17 only a couple of degrees distant. The planets were then to be seen in the evening.

The conjunction of *Mars* and *Saturn* near *Regulus* most nearly resembling that of the present year, when they are morning stars, must have occurred in the year 1447, but I am not aware that there exists any record of its having been observed. For a long period previous to 1447 no similar close conjunction has occurred.

The interest of the present year's conjunction is enhanced by another circumstance. On September 25 *Venus* will pass *Regulus* at a distance of 11′, and will, in the following week, come into conjunction with *Saturn* and with *Mars*.

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If the old Chaldeans were in fact such diligent stargazers as they are sometimes represented, they must have been watchful in observing conjunctions of the planets with one another and with fixed stars, such as are to be found in the records of Chinese and of Arabian observers, which have been made accessible to us by Gaubil and by Caussin. The cuneiform inscriptions have not yet yielded up the secreted records of such observations, which would be of essential service in settling questions of their chronology. Perhaps some day the old Chaldean observations may yet be made accessible. But I doubt whether, however far they may go back, there will be found in them a combination of conjunctions resembling that of next September; for I question whether, since the beginning of Scaliger's Julian period or during the last six thousand years, any year can be found in which this special combination of conjunctions has occurred. Hence it will be worth while to be on the alert to observe it. And useful observations may be made with the naked eye. In the old records are found apparent occultations of *Mars* and of *Jupiter* by *Venus*, of *Jupiter* by *Mars*, of *Regulus* by *Venus* and by *Jupiter*, &c., but it is uncertain what are the limits of distance within which such bright bodies appear to the naked eye as one. Though no apparent occultation of *Saturn* by *Mars* is on record, the careful watching of the two planets and noting the times when, without undue straining of the eyes, they cease to appear separated, and when they begin again to appear so, will be of service in correctly interpreting the old observations. On September 19 the geocentric distance of their centres will be

	′		h	m		h	m	
within	2	from	18	44	to	21	30	Gr. m. t.
	3	„	17	53	„	22	20	
	4	„	17	4	„	23	9	
	5	„	16	16	„	23	57	

As the planets are only 30° from the Sun, the beginning and ending of the apparent occultation cannot be observed from the same place. But, as any trustworthy schoolboy or schoolgirl may be entrusted with taking part in the watching, there ought to be no lack of numerous observers of the phenomenon in favoured terrestrial longitudes. The opportunity may also be taken to watch when the planets and *Regulus* cease to be visible in the morning twilight, and by repeating the watching and observing the altered positions of the three planets and of the star on the following mornings to gain some instructive astronomical knowledge.

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On the Eclipse of Iapetus by Saturn and its Ring-System, on November 1–2, 1889. By A. Marth.

The inclination of the orbit of *Iapetus* to the plane of the ring being nearly 14°, while the orbits of the other satellites have inclinations of less than 1°, the rare eclipses of *Iapetus* by the ring-system offer the only chance of deciding several questions which may be settled with the help of observed eclipses. No such observation has ever yet been made. Favourably-placed observers ought, therefore, to take full advantage of the rare chance they may get on November 1. There will not be another such chance for at least the next sixteen years.

The geocentric differences of right ascension and declination between *Titan* and *Iapetus* and the centre of *Saturn* will be from October 24 to November 4.

	Titan.		*Iapetus.*	
Greenwich Noon.	$\alpha_6 - A.$	$\delta_6 - D.$	$\alpha_8 - A.$	$\delta_8 - D.$
	s	″	s	″
Oct. 24	+ 1·60	−24·5	−23·73	+28·6
25	+ 5·90	−14·5	−21·79	+28·3
26	+ 9·31	− 2·4	−19·72	+27 8
27	+11 26	+10·0	−17·53	+27·2
28	+11·39	+20·8	−15·24	+26·4
29	+ 9·64	+28·1	−12·85	+25·4
30	+ 6·29	+30·7	−10·38	+24·3
31	+ 1·88	+28·2	− 7·84	+23·0
Nov. 1	− 2·84	+21·1	− 5·25	+21·5
2	− 7·14	+10·8	− 2·62	+19·9
3	−10·37	− 1·3	+ 0·04	+18·1
4	−12·09	−13·1	+ 2·70	+16·3

These values show that, while the Earth is still on the south side of the plane of the orbit of *Titan*, it has already passed through the plane of the orbit of *Iapetus*, and is on the north side of that plane. Hence *Titan* and *Iapetus*, though both being north of the planet, move apparently in opposite directions, *Titan* being in front of the planet, or near inferior conjunction, while *Iapetus* is beyond the planet, or near superior conjunction. On October 31, at $10^{h}\!\cdot\!5$ G.M.T., *Titan* passes in the direction of the minor axis of the ring at a distance of 26″ to the north. On November 1, at $8^{h}\!\cdot\!0$ G.M.T., *Iapetus* encounters